

WHAT IS CLAIMED IS:

1. A hydrogen absorbing tank apparatus comprising:  
a hydrogen absorbing tank containing a hydrogen absorbing material  
that allows hydrogen gas to move into the hydrogen absorbing tank from an outside  
5 thereof and to move out of the hydrogen absorbing tank;  
a gas compressor disposed between the hydrogen absorbing tank and a  
hydrogen gas consumer device, the gas compressor compressing the hydrogen gas  
output from the hydrogen absorbing tank at least to a predetermined reference pressure  
of the hydrogen gas consumer device;  
10 a bypass that opens only when a hydrogen gas generating pressure of the  
hydrogen absorbing tank is higher than the predetermined reference pressure, the  
bypass connected between the hydrogen absorbing tank and the hydrogen gas consumer  
device in parallel to the gas compressor; and  
a controller that operates the gas compressor to compress hydrogen gas  
15 output from the hydrogen absorbing tank at least to the predetermined reference  
pressure when the hydrogen absorbing tank has a low temperature and the hydrogen gas  
generating pressure of the hydrogen absorbing tank is believed to be lower than the  
predetermined reference pressure.
2. A hydrogen absorbing tank apparatus according to claim 1, wherein:  
20 the hydrogen absorbing tank has a temperature sensor; and  
the controller determines whether the hydrogen gas generating pressure  
is lower than the predetermined reference pressure based on a temperature detected by  
the temperature sensor.
3. A hydrogen absorbing tank apparatus according to claim 1, wherein:  
25 the hydrogen absorbing tank has a pressure sensor; and  
the controller determines whether the hydrogen gas generating pressure  
is lower than the predetermined reference pressure based on a pressure detected by the  
pressure sensor.
4. A hydrogen absorbing tank apparatus according to claim 1, wherein:  
30 the hydrogen gas consumer device includes a fuel cell from which heat is  
supplied to the hydrogen absorbing tank; and  
the controller operates the gas compressor during an initial period of  
operation of the fuel cell.

5. A hydrogen absorbing tank apparatus according to claim 4, wherein at least one of the gas compressor and a motor that operates the gas compressor is connected to at least one of the fuel cell and the hydrogen absorbing tank by a heating medium circulating passage in which a heating medium circulates, and the at least one of the fuel cell and the hydrogen absorbing tank is heated by the heating medium heated by the at least one of the gas compressor and the motor that operates the gas compressor.

6. A hydrogen absorbing tank apparatus according to claim 4, wherein the controller operates the gas compressor when an amount of hydrogen stored in the hydrogen absorbing tank has decreased and the hydrogen gas generating pressure of the hydrogen absorbing tank has decreased.

7. A hydrogen absorbing tank apparatus according to claim 4, further comprising:

a hydrogen gas generator that supplies hydrogen gas to the hydrogen absorbing tank; wherein

when a hydrogen gas generating pressure of the hydrogen gas generator is lower than a predetermined pressure, the controller increases, by using the gas compressor, a pressure of hydrogen gas supplied from the hydrogen gas generator to the hydrogen absorbing tank.

8. A hydrogen absorbing tank apparatus according to claim 4, further comprising:

a hydrogen gas generator that supplies hydrogen gas to the hydrogen gas consumer device; wherein

when a hydrogen gas generating pressure of the hydrogen gas generator is lower than the reference pressure of the hydrogen gas consumer device, the controller increases, by using the gas compressor, a pressure of hydrogen gas supplied from the hydrogen gas generator to the hydrogen consumer device.

9. A hydrogen absorbing tank apparatus according to claim 1, wherein the bypass includes a bypass passage that bypasses the gas compressor, and a valve provided in the bypass passage, the valve being openable at a predetermined pressure.

10. A hydrogen absorbing tank apparatus comprising:

a hydrogen absorbing tank containing a hydrogen absorbing material, a hydrogen inlet and a hydrogen outlet;

5

15

20

25

30

using a bypass connected between the hydrogen absorbing tank and the hydrogen gas consumer device in parallel to the gas compressor to convey the hydrogen gas from the hydrogen absorbing tank to the hydrogen gas consumer device, the bypass opening only when a hydrogen gas generating pressure of the hydrogen absorbing tank is higher than the predetermined reference pressure; and

controlling the gas compressor to compress hydrogen gas output from the hydrogen absorbing tank at least to the predetermined reference pressure when the hydrogen absorbing tank has a low temperature and the hydrogen gas generating pressure of the hydrogen absorbing tank is believed to be lower than the predetermined reference pressure.

15. A method according to claim 14, further comprising:  
detecting a temperature of the hydrogen absorbing tank; and  
controlling the gas compressor by determining whether the hydrogen gas generating pressure is lower than the predetermined reference pressure based on the detected temperature.

16. A method according to claim 14, further comprising:  
detecting a pressure of the hydrogen absorbing tank; and  
controlling the gas compressor by determining whether the hydrogen gas generating pressure is lower than the predetermined reference pressure based on the detected pressure.

17. A method according to claim 14, wherein:  
the hydrogen gas consumer device includes a fuel cell from which heat is supplied to the hydrogen absorbing tank; and  
the controlling step includes operating the gas compressor during an initial period of operation of the fuel cell.

18. A method according to claim 17, wherein at least one of the gas compressor and a motor that operates the gas compressor is connected to at least one of the fuel cell and the hydrogen absorbing tank by a heating medium circulating passage in which a heating medium circulates, and the at least one of the fuel cell and the hydrogen absorbing tank is heated by the heating medium heated by the at least one of the gas compressor and the motor that operates the gas compressor.

19. A method according to claim 17, wherein the controlling step includes operating the gas compressor when an amount of hydrogen stored in the hydrogen

absorbing tank has decreased and the hydrogen gas generating pressure of the hydrogen absorbing tank has decreased.

20. A method according to claim 17, further comprising:  
supplying hydrogen gas to the hydrogen absorbing tank with a hydrogen  
5 gas generator; and  
when a hydrogen gas generating pressure of the hydrogen gas generator  
is lower than a predetermined pressure, the controlling step includes increasing, by  
using the gas compressor, a pressure of hydrogen gas supplied from the hydrogen gas  
generator to the hydrogen absorbing tank.

10 21. A method according to claim 17, further comprising:  
supplying hydrogen gas to the hydrogen gas consumer device with a  
hydrogen gas generator; and  
when a hydrogen gas generating pressure of the hydrogen gas generator  
is lower than the predetermined reference pressure of the hydrogen gas consumer  
15 device, the controlling step includes increasing, by using the gas compressor, a pressure  
of hydrogen gas supplied from the hydrogen gas generator to the hydrogen gas  
consumer device.

22. A method according to claim 14, wherein the bypass includes a bypass  
passage that bypasses the gas compressor, and a valve provided in the bypass passage,  
20 the valve is opened at a predetermined pressure.